



## 2013 Air Quality Progress Report for *Royal Borough Of Greenwich*

In fulfillment of Part IV of the  
Environment Act 1995  
Local Air Quality Management

April 2014



**CLEANER AIR**  
**FOR LONDON**

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## Executive Summary

The Royal Borough of Greenwich Council is committed to becoming a Clean Air Borough through working with the Greater London Authority and others to improve air quality in the Borough. As such the Council is demonstrating its political leadership; taking action; leading by example; using the planning system; integrating air quality into the public health system; and informing the public. This 2013 Air Quality Progress report fulfils one aspect of this ongoing commitment.

The Council's Air Quality Progress report updates recent air quality monitoring in Greenwich and considers other local developments that might affect local air quality. If major changes are noted the Council is required to undertake a Detailed Assessment. This is in accordance with Defra LAQM guidance.

The report also considers the actions that the Council and others are undertaking in pursuit of the objectives under Part IV of the Environment Act 1995.

The report identifies that:

From the monitoring and local developments there is no need to undertake a Detailed Assessment.

For nitrogen dioxide and particles (specifically PM<sub>10</sub>) the Council has previously designated an Air Quality Management Area (AQMA) across the Borough. The emission sources for these pollutants are dominated by road transport in the Borough. The findings from this report indicate that the AQMA should be maintained.

In view of the findings the Council will undertake the following actions:

1. Undertake consultation with the statutory and other consultees as required.
2. Maintain the existing monitoring programme.

3. Continue with its Air Quality Action Plan in pursuit of the AQS objectives.
4. Prepare for the submission of its next Air Quality report.

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# **1 Introduction**

## **1.1 Description of Local Authority Area**

The Royal Borough of Greenwich is part of Inner London, situated to the south east of the centre of London. The river Thames borders to the north with Tower Hamlets and Newham on the opposite bank, with the Boroughs of Lewisham to the west, Bexley to the east and Bromley to the south. The Royal Borough covers an area of about 5,000 hectares and includes the major district centres of Greenwich (a World Heritage site), Woolwich, Eltham, Charlton and Thamesmead. Royal Greenwich was also a host borough for the 2012 London Olympics. The estimated population for 2011 was 245,600 (from the Office of National Statistics (ONS)) and this will increase as approximately 18,000 new homes will be constructed in Royal Greenwich over the coming years.

The main sources of atmospheric pollutants are road transport, although there are important industrial sources to the north of the Royal Borough and close to its boundaries. The principal roads through the Royal Borough include the A102 (M), A2, the A20, the A205, A206 and A207. The southern portal of the Blackwall tunnel is also within the Royal Borough.

## **1.2 Purpose of Progress Report**

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. LAQM places an obligation on the Council to regularly review and assess air quality in its area and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Council should undertake a Detailed Assessment immediately and not wait until the next round of Review and Assessment.

### **1.3 Air Quality Objectives**

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g m}^{-3}$  (milligrammes per cubic metre,  $\text{mg m}^{-3}$  for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).



**Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g m}^{-3}$	Running annual mean	31.12.2003
	5.00 $\mu\text{g m}^{-3}$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g m}^{-3}$	Running annual mean	31.12.2003
Carbon monoxide	10 $\text{mg m}^{-3}$	Running 8-hour mean	31.12.2003
Lead	0.50 $\mu\text{g m}^{-3}$	Annual mean	31.12.2004
	0.25 $\mu\text{g m}^{-3}$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g m}^{-3}$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g m}^{-3}$	Annual mean	31.12.2005
Particulate Matter (PM <sub>10</sub> ) (gravimetric)	50 $\mu\text{g m}^{-3}$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g m}^{-3}$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g m}^{-3}$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g m}^{-3}$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g m}^{-3}$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

**Table 1.2 Air Quality Objectives not included in Regulations for the purpose of LAQM in England**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
PM <sub>2.5</sub> (Not Scotland)	25 µg m <sup>-3</sup>	Annual mean	2020
	Target of 15% reduction in concentrations at urban background locations	3-year mean	Between 2010 and 2020
Ozone	100 µg m <sup>-3</sup> not to be exceeded more than 10 times a year	8 hour mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

The Royal Borough of Greenwich has previously completed all earlier stages of air quality review and assessment as required under the LAQM regime. As part of its earlier duties the Council completed a Detailed Assessment for nitrogen dioxide (NO<sub>2</sub>) and particles (PM<sub>10</sub>) in 2000. The aim of this was to determine with reasonable certainty whether or not there is a likelihood of the AQ objectives being achieved. The assumptions used were therefore in depth and the data used were quality assured to a high standard. This allowed the Council to have confidence in reaching a decision whether to declare an Air Quality Management Area or not. When carrying out its Detailed Assessment the Council applied its best estimates to all components used to produce the estimated future concentrations.

Modelled predictions confirmed that the annual mean NO<sub>2</sub> and PM<sub>10</sub> objectives were exceeded. These predictions highlighted that the objectives were exceeded in areas close to busy roads and junctions throughout the Borough. Relevant public exposure was identified in these areas and on the basis of the findings **the Council designated the whole Borough an Air Quality Management Area (AQMA) for the NO<sub>2</sub> and PM<sub>10</sub> in 2001.**

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The Council also completed all previous rounds of LAQM and started the fifth round of review and assessment, completing its 2012 Updating and Screening Assessment. The conclusion of that work was that the Council should maintain its AQMA.

## 2 New Monitoring Data

### 2.1 Summary of Monitoring Undertaken

#### 2.1.1 Automatic Monitoring Sites

The Council has undertaken automatic monitoring in the Borough at 11 fixed long-term sites since the last Updating and Screening Assessment (2012). The automatic sites operating since then are:

Eltham (GR4) - a suburban background site in the east of the Borough (this site has been operating since 1995) and is part of the government's AURN. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=GR4&bulletin=hourly&la\\_id=11&bulletindate=26/03/2014&postcode=&MapType=Google&VenueCode=&zoom=11&lat=51.4744&lon=0.055573699999968085&Species=All&laEdge=Y&WhoBulletin=](http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=GR4&bulletin=hourly&la_id=11&bulletindate=26/03/2014&postcode=&MapType=Google&VenueCode=&zoom=11&lat=51.4744&lon=0.055573699999968085&Species=All&laEdge=Y&WhoBulletin=))

Trafalgar Road (GR5) – roadside site located next to a leisure centre (this site started operating during 1996). (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR5&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.47963397740143&lon=0.023712610116266575&laEdge=Y&details=](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR5&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.47963397740143&lon=0.023712610116266575&laEdge=Y&details=))

Blackheath Hill (GR7) - a site located next to a block of flats close to Blackheath Hill (monitoring at this site commenced in 2002). The sample inlet is located 20m from the road. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR7&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR7&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=))

Woolwich Flyover (GR8) – a site located under the flyover of the A102 and next to a busy roundabout. The sample inlet is 3m high and in line with the façade of the nearest house. It is approximately 3m from the kerb. This site commenced operating in 2004. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR8&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR8&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=))

Westthorne Avenue (GR9) – a site located near to housing in the grounds of a community centre (monitoring at this site commenced in 2004). The sample inlet is

approximately 12m from the kerb of the A205. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR9&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GR9&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=))

Burrage Grove (GN0) – a roadside site located on the A206 in Thamesmead West.

Monitoring started in 2004. The sample inlet is approximately 3m from the kerb. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GN0&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GN0&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=))

Millennium Village (GN2) – a background site (that is close to industry) towards the north on the Greenwich Peninsula; monitoring commenced in 2004. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=GN2&details=general&mapview=All&la\\_id=11&network=All&VenueCode=](http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=GN2&details=general&mapview=All&la_id=11&network=All&VenueCode=))

Plumstead High Street (GN3) – a roadside site located, towards the northeast of the Royal Borough. Monitoring started in 2006. The site is adjacent to housing and the sample inlet is approximately 3m from the kerb. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GN3&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=general](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GN3&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=general))

Falconwood (GB6) - a roadside site on the A2 close to the Borough boundary (it is shared with the LB of Bexley and has been operating since 2000). The sample inlet is located 12m from the road. GB0 is also located at this site (it monitors PM<sub>10</sub> using a FDMS analyser). (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GB6&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=general](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GB6&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=general))

Thamesmead (BX3) – a suburban background site that opened in 1998, located at a school. PM<sub>2.5</sub> is currently the only monitored pollutant at this site. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=BX3&details=general&mapview=All&la\\_id=11&network=All&VenueCode=](http://www.londonair.org.uk/london/asp/publicdetails.asp?region=0&site=BX3&details=general&mapview=All&la_id=11&network=All&VenueCode=))

Fiveways, Sidcup Road (GN4) - a roadside site on the A20 that started operating in late January 2011. The sample inlet is located 2m from the road. (See

[http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GN4&Maptype=Google&mapview=All&la\\_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=general](http://www.londonair.org.uk/london/asp/publicdetails.asp?site=GN4&Maptype=Google&mapview=All&la_id=11&zoom=11&lat=51.4744&lon=0.055573699999968085&laEdge=Y&details=general))

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The above sites are also representative of relevant exposure. All the sites are part of the London Air Quality Network and therefore the standards of QA/QC are similar to those of the government's AURN sites. Regular calibrations are carried out, with subsequent data ratification undertaken by the ERG at King's College London. In all cases the data are fully ratified unless reported otherwise. Further details of the sites can be found at [www.londonair.org.uk](http://www.londonair.org.uk).

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	Easting	Northing	Pollutants Monitored	In AQMA?	PM <sub>10</sub> Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance (m) to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Eltham (GR4)	Suburban	543978	174655	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (FDMS) SO <sub>2</sub> (and O <sub>3</sub> )	Y	FDMS	Y	N/A	N
Trafalgar Road (GR5)	Roadside	538960	177954	NO <sub>2</sub> PM <sub>10</sub>	Y	TEOM	Y	5	Y
Blackheath Hill (GR7)	Roadside	538141	176710	NO <sub>2</sub> PM <sub>10</sub>	Y	FDMS	Y	20	N
Woolwich Flyover (GR8)	Roadside	540200	178367	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (FDMS) (and O <sub>3</sub> )	Y	TEOM	Y	3	Y
Westthorne Avenue (GR9)	Roadside	541879	175016	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (FDMS) (and O <sub>3</sub> )	Y	FDMS	Y	12	N
Burrage Grove (GN0) note - previously GR10	Roadside	544084	178881	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (FDMS)	Y	FDMS	Y (1)	3	Y
Millennium Village (GN2) note - previously GR12	Industrial background	540169	178999	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (FDMS)	Y	FDMS	Y	N/A	Y
Plumstead High St (GN3) note - previously GR13	Roadside	545560	178526	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (FDMS) (and O <sub>3</sub> )	Y	FDMS	Y	5	Y

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Site Name	Site Type	Easting	Northing	Pollutants Monitored	In AQMA?	PM <sub>10</sub> Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance (m) to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Falconwood (GB6)	Roadside	544997	175098	NO <sub>2</sub> PM <sub>10</sub> PM <sub>2.5</sub> (TEOM) (and O <sub>3</sub> )	Y	TEOM	Y (5)	12	Y
Thamesmead (BX3)	Suburban	547323	181231	PM <sub>2.5</sub> (TEOM)	Y	-	Y	N/A	N
Fiveways Sidcup Road (GN4)	Roadside	543582	172653	NO <sub>2</sub> PM <sub>10</sub>	Y	FDMS	Y (5)	2	Y

Notes:

- 1) GB0 is a FDMS analyser located at the Falconwood GB6 site.
- 2) BX3 in Thamesmead now only monitors PM<sub>2.5</sub> (since 2005).



## 2.1.2 Non-Automatic Monitoring Sites

The Royal Borough of Greenwich started its diffusion tube monitoring to supplement and extend its understanding of air quality. Following some initial changes to the network, the site locations have remained broadly the same since 2000.

### Nitrogen dioxide

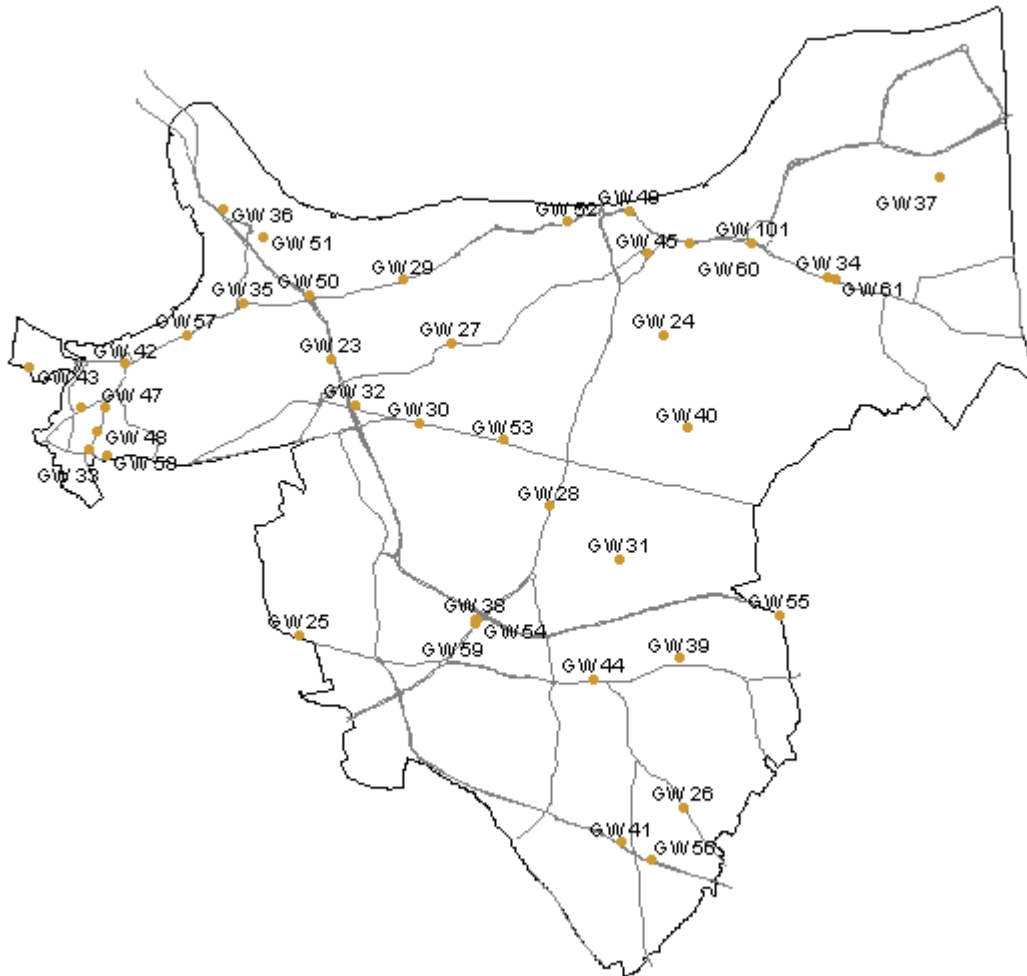
During the 2009 – 2012, 58 diffusion tubes at 42 locations throughout the Borough were deployed as part of the London Wide Environment Programme (LWEP). The diffusion tubes used were supplied by Bureau Veritas and analysed by Gradko International using a preparation method of 50% TEA in acetone.

Gradko participates in the Health and Safety Laboratory's (HSL) Workplace Analysis Scheme for Proficiency (WASP) programme for diffusion tubes, which provides a Quality Assurance / Quality Control (QA/QC). The scheme is an important QA/QC exercise for laboratories supplying diffusion tubes to local authorities for use in the context of Local Air Quality Management (LAQM). Between January 2012 and March 2013, Gradko achieved a satisfactory Performance Criteria Score in the laboratory performance testing rounds 116 - 120. The precision results were also good for this period.

The locations of the diffusion tubes are illustrated in Figure 2.1. The monitoring also includes eight triplicate sites co-located with automatic monitoring stations.

Diffusion tube site	Continuous site	Location
<b>GW39</b>	Greenwich 4	Eltham
<b>GW57</b>	Greenwich 5	Trafalgar Road
<b>GW55</b>	Greenwich Bexley 6	Falconwood A2
<b>GW58</b>	Greenwich 7	Blackheath Hill
<b>GW50</b>	Greenwich 8	Woolwich Road Flyover
<b>GW59</b>	Greenwich 9	Westthorne Avenue
<b>GW60</b>	Greenwich 10	Burrage Grove A206
<b>GW61</b>	Greenwich 12	Millennium Village

Figure 2.1 Map of Non-Automatic Monitoring Sites



A major disadvantage of undertaking monitoring using diffusion tubes is that the method is less precise and accurate than continuous monitoring. The recommended methods to reduce errors include the use of good QA/QC practices and bias adjustment factors that are derived from co-location studies between continuous analysers and diffusion tubes.

The bias adjustment factors are specific to each year, analysing laboratory, method of analysis and location. The factors are therefore also limited to the data supplied. The Review and Assessment website advises that “in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the ‘best estimate’ of the ‘true’ annual mean concentration, it is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is  $\pm$

20% (at 95% confidence level). This compares with a typical value of  $\pm 10\%$  for chemiluminescence monitors subject to appropriate QA/QC procedures.”

A local bias adjustment factor was calculated to apply bias correction to the raw diffusion tube results. This factor was obtained from the LWEF programme and based on triplicate tubes that were co-located alongside eleven continuous NO<sub>2</sub> monitoring sites in London. The measurement data used from the continuous monitoring sites covered the same period of diffusion tube monitoring. Period mean NO<sub>2</sub> concentrations were calculated for each diffusion tube exposure period. Data capture statistics for the same periods were also determined.

Bias correction factors were also undertaken using the most recent default factor spreadsheet from Defra’s helpdesk (September 2013). These default factors are based on statistical analyses of reported data provided by other local authorities.

Year	Bias Default factor	Local Bias factor
2012	1.02 (21 studies)	1.04
2011	0.95 (25 studies)	1.02
2010	1.03 (16 studies)	1.06

There was reasonable agreement between the sets of factors, with slightly poorer agreement for 2011. There are many potential reasons for this discrepancy, however good precision was indicated by the local triplicate studies.

The choice of bias factors is discussed in the TG09 guidance and this suggests that both precision and QA/QC procedures are important, although the final choice is down to the local authority concerned. Based on the good precision of the local studies **the local bias factors were used**. This is also consistent with the Council’s most recent progress reports. The 2012 local default factor indicates that the diffusion tube results for slightly underestimate continuously monitored concentrations.

## Benzene

In addition to the NO<sub>2</sub> diffusion tube monitoring the Council also undertakes the monitoring of benzene using passive diffusion tubes at three sites (two roadside (GW42 and GW50) and a background site (GW39)). The tubes are supplied and analysed by Gradko International Ltd, a UKAS accredited laboratory. The Council does not operate continuous analyser for benzene and hence no bias correction has been undertaken. The monitored sites are all co-located with NO<sub>2</sub> diffusion tube sites (as shown in Table 2.2).

Table 2.2 Details of Non- Automatic Monitoring Sites

Ref (Tube no.)	Address	Easting	Northing	Location	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
GW23 (1)	Siebert Rd	540420	177706	Roadside	Y	17.2	Y
GW24 (2)	Plumstead Common Rd	543806	177951	Roadside	Y	3.0	Y
GW25 (3)	Eltham Rd	540099	174881	Roadside	Y	3.0	Y
GW26 (4)	Foots Cray Rd	544015	173139	Roadside	Y	0.5	Y
GW27 (5)	Charlton Village	541645	177874	Roadside	Y	0.5	Y
GW28 (58)	Dunblane Rd	542656	176207	Roadside	Y	7.5	Y
GW29 (6)	Woolwich Rd Charlton	541167	178512	Roadside	Y	1.5	Y
GW30 (53)	Indus Rd	541372	177070	Roadside	Y	5.0	Y
GW31 (57)	Deansfield School	543383	175664	Roadside	Y	3.0	Y
GW32 (7)	Banchory Rd	540664	177235	Roadside	Y	17.1	Y
GW33 (8)	Blackheath Hill	537971	176776	Roadside	Y	1.5	Y
GW34 (9)	Bannockburn School	545490	178543	Roadside	Y	3.0	Y
GW35 (10)	Woolwich Rd Greenwich	539527	178281	Roadside	Y	1.5	Y
GW36 (11)	Boord St	539320	179234	Roadside	Y	30.0	Y
GW37 (12)	De Lucy School	546630	179557	Background	Y	215.0	N
GW38 (13)	Westhorne Av	541885	175045	Intermediate	Y	30.0	N
GW39 (14,15,16)	Bexley Rd ECC (Triplicate co-located site)	543986	174660	Intermediate	Y	65.0	N
GW40 (17)	Shrewsbury House	544065	176996	Background	Y	575.0	N
GW41 (18)	Sidcup Rd	543391	172765	Roadside	Y	3.0	Y
GW42 (19)	Greenwich Church St	538317	177652	Roadside	Y	2.0	Y
GW43 (20)	Creek Rd	537353	177632	Roadside	Y	2.0	Y
GW44 (21)	Eltham High St	543096	174439	Roadside	Y	3.6	Y
GW48 (23)	Greenwich South St	538044	176960	Roadside	Y	2.5	Y

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GW49 (24)	Woolwich High St	543472	179217	Roadside	Y	1.0	Y
GW50 (25,26,27)	Woolwich Flyover (Triplicate co-located site)	540203	178367	Roadside	Y	3.5	Y
GW51 (28)	Bugsbys Way	539638	179024	Roadside	Y	2.0	Y
GW52 (29)	Woolwich High St	542842	179108	Roadside	Y	1.5	Y
GW53 (30)	Shooters Hill Rd	542181	176878	Roadside	Y	1.5	Y
GW54 (31)	Westhorne Av	541915	175039	Roadside	Y	2.5	Y
GW55 (32,33,34)	Crown Woods Way (Triplicate co-located site)	545005	175097	Roadside	Y	1.5	Y
GW56 (35)	Sidcup Rd	543679	172598	Roadside	Y	1.5	Y
GW57 (36,37,38)	Trafalgar Rd Greenwich (Triplicate co-located site)	538968	177955	Roadside	Y	7.0	Y
GW58 (39,40,41)	Blackheath Hill (Triplicate co-located site)	538143	176712	Roadside	Y	4.0	Y
GW59 (42,43,44)	Westhorne Av (Triplicate co-located site)	541883	175016	Roadside	Y	13.0	Y
GW60 (45,46,47)	Burrage Grove (Triplicate co-located site)	544086	178882	Roadside	Y	16.9	Y
GW61 (50,51,52)	Millennium Village (Triplicate co-located site)	540175	179000	Intermediate	Y	n/a	N
GW101 (48)	Plumstead Rd	544727	178884	Roadside	Y	1.0	Y
GW102 (49)	Plumstead Rd	544075	178898	Roadside	Y	1.0	Y
GW103 (54)	Wricklemarsh Rd	540935	176575	Roadside	Y	9.0	Y
GW104 (55)	Sun Lane	540743	177072	Roadside	Y	12.5	Y
GW105 (56)	Cliftons Roundabout	541143	174294	Roadside	Y	5.0	Y
GW106 (22)	Grand Depot Rd	543505	178576	Roadside	Y	1.0	Y

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

The monitoring reported below represents the continuous results for recent years' monitoring up to the end of 2013. The results are reported in accordance with the requirements of TG09. Further details of the automatic sites, including site maps, site photographs can also be found on the London Air Quality Network website (See <http://www.londonair.org.uk/london/asp/lahome.asp>).

### 2.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

The results for nitrogen dioxide are reported separately for the Council's automatic sites and diffusion tube network. The automatic results are directly compared to the annual mean and hourly mean objectives, whereas the diffusion tube results are compared to the annual mean objective and also to an annual mean of 60 µg m<sup>-3</sup>, which represents an indicative value to represent the hourly mean objective. This is line with TG09 guidance.

#### Automatic Monitoring Data

The nitrogen dioxide monitoring results for the Council's automatic sites are compared directly to the annual mean and hourly mean objectives. The following tables (Tables 2.3 and 2.4) provide results for the period from 2009 to 2013 inclusive and the 2013 data only includes provisional data. The sites locations are typical of public exposure in much of the Royal Borough. However it is the roadside areas within the Borough that have the highest concentrations.

Data capture for 2013 at the sites was mostly good (representing around 90% of the year), apart from GR12 at Millennium Village, which still achieved 75%. This data loss was as a result of instrument problems at this site during the summer. For previous years the data capture at all sites was also good, as reported previously (see earlier Council reports).

The suburban site at Eltham Green (GR4) met the AQS annual mean objective of 40 µg m<sup>-3</sup> for 2013, with concentrations around 22 µg m<sup>-3</sup>; this concentration was similar

to that of previous years at this background site. The other background site in the Borough (i.e. the site at Millennium Village (GR12)) which also met the objective for all years when monitoring was undertaken. Concentrations at this site (which is located closer to industry) were however higher than GR4, around  $37 \mu\text{g m}^{-3}$  in both 2012 and 2013.

The GR5 roadside site at Trafalgar Road just met the objective for 2013, having exceeded the objective for all previous years reported. The only roadside site to meet the objective other than GR5 was that in Plumstead High Street (GN3).

Concentrations at this site were slightly less than the  $40 \mu\text{g m}^{-3}$  in both 2012 and 2013. Prior to this concentrations had always exceeded the objective.

There was a fall in concentrations at the GR8 site by the Woolwich Flyover; however this site has consistently monitored concentrations that easily exceed the objective. The annual mean for 2013 was  $64 \mu\text{g m}^{-3}$ . The nearest residential façade to the monitoring location is at a similar distance back from the kerb, thus this concentration is considered representative of relevant exposure, indicating the highly polluted nature of this site.

The sites at Blackheath Hill (GR7), Westthorne Avenue (GR9), Burrage Grove (GN0), Falconwood (GB6) and Fiveways (GN4) also easily exceeded the objective for all years reported, monitoring annual mean concentrations in 2013 that ranged between  $45$  and  $53 \mu\text{g m}^{-3}$ . Concentrations at all these sites were mostly slightly higher (or the same) as in 2013. The façades of the nearest receptors to the GR7, GR9 and GN0 sites are close to the monitoring sites and thus the measured concentrations represent the level of exposure. The GB6 and GN4 sites are both located 5m closer to the roadside. The estimated concentration at the nearest façades using the  $\text{NO}_2$  with distance calculator (provided by Defra) at GB6 and GN4 is  $44.8$  and  $46.3 \mu\text{g m}^{-3}$  respectively; this indicates that the nearest façades at both sites exceed the objective. (Note - the GR4 site was used to represent background concentrations).

Table 2.4 provides a comparison with the AQS hourly mean objective, which requires that the number of periods that exceed a 24-hour mean of  $200 \mu\text{g m}^{-3}$  does not arise more than 18 times over a calendar year. These episodic periods arise during



meteorological conditions that are conducive e.g. such as settled conditions in the wintertime when there is reduced dispersion from local sources.

The 2013 results show that none of the sites exceeded the hourly mean objective. The GR8 site at the Woolwich flyover however has exceeded the objective in previous years (2012 being the most recent year). The annual mean concentration at the site also exceeded the indicative annual mean of  $60 \mu\text{g m}^{-3}$  in 2013, albeit only 8 hours were recorded as exceeding the hourly mean standard of  $200 \mu\text{g m}^{-3}$ . The GB6 site at Falconwood has also exceeded this objective in the recent past (i.e. 2012) and it recorded the highest number of periods exceeded of the Greenwich sites in 2013, with 11 hours recorded. The sites at GR7 Blackheath Hill, GR9 Westhorne Avenue and GN4 Fiveways all recorded periods that exceeded the hourly standard on at least one occasion during 2013.

To understand changes in  $\text{NO}_2$  concentrations it is necessary to also consider concentrations of  $\text{NO}_x$ , which is the primary precursor pollutant of  $\text{NO}_2$ . For  $\text{NO}_x$  concentrations have fallen across London generally and more specifically fallen fastest at roadside sites, though the rate of decline has decreased in recent years. This overall decrease in  $\text{NO}_x$  concentrations reflects the abatement of vehicle emissions; however, the recent trend showing the stability of concentration levels across London gives rise to concern regarding control of  $\text{NO}_2$ . These measurements have confirmed that  $\text{NO}_x$  and  $\text{NO}_2$  concentrations were not responding as expected to the projected decreases in vehicle emissions (KCL, 2012).

**Table 2.3 Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )				
					2009	2010	2011	2012	2013
Eltham (GR4)	Suburban	Y	N/a	99	24	24	23	22	22
Trafalgar Road (GR5)	Roadside	Y	N/a	99	48	47	42	44	39
Blackheath Hill (GR7)	Roadside	Y	N/a	86	43	43	48	48	48
Woolwich Flyover (GR8)	Roadside	Y	N/a	100	82	73	67	71	64
Westhorne Avenue (GR9)	Roadside	Y	N/a	100	45	46	43	44	46
Burrage Grove (GR10)	Roadside	Y	N/a	100	49	53	43	45	45
Millennium Village (GR12)	Industrial background	Y	N/a	75	36	36	33	37	37
Plumstead High St (GR13)	Roadside	Y	N/a	98	44	42	42	39	37

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Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )				
					2009	2010	2011	2012	2013
Falconwood (GB6)	Roadside	Y	N/a	94	<b>45</b>	<b>51</b>	<b>42</b>	<b>47</b>	<b>51</b>
Fiveways Sidcup Road (GN4)	Roadside	Y	N/a	95	-	-	<b>47</b>	<b>52</b>	<b>53</b>

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g m}^{-3}$

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

*Italics* represent data capture of less than 90%.

**Table 2.4 Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with 1-hour Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Number of Hourly Means > 200µg m <sup>-3</sup>				
					2009	2010	2011	2012	2013
Eltham (GR4)	Suburban	Y	N/a	99	0	4	0	0	0
Trafalgar Road (GR5)	Roadside	Y	N/a	99	2	0	0	0	0
Blackheath Hill (GR7)	Roadside	Y	N/a	86	0	0	1	0	1
Woolwich Flyover (GR8)	Roadside	Y	N/a	100	<b>53</b>	<b>38</b>	6	<b>27</b>	8
Westhorne Avenue (GR9)	Roadside	Y	N/a	100	0	0	0	0	4
Burrage Grove (GN0)	Roadside	Y	N/a	100	3	1	1	1	0
Millennium Village (GN2)	Urban background	Y	N/a	75	0	0	0	2	1
Plumstead High St (GN3)	Roadside	Y	N/a	98	0	1	0	0	0
Falconwood (GB6)	Roadside	Y	N/a	94	6	5	7	<b>21</b>	11

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Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Number of Hourly Means > 200µg m <sup>-3</sup>				
					2009	2010	2011	2012	2013
Fiveways Sidcup Road (GN4)	Roadside	Y	N/a	95	-	-	0	1	6

In bold, exceedence of the NO<sub>2</sub> hourly mean AQS objective (200µg m<sup>-3</sup> – not to be exceeded more than 18 times per year)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

## Diffusion Tube Monitoring Data

The results given in Table 2.5 are the bias adjusted values for the diffusion tubes exposed (as detailed earlier on page 17). The annual mean concentrations that exceeded the  $40 \mu\text{g m}^{-3}$  annual mean  $\text{NO}_2$  objective are highlighted in bold. Those results that exceeded  $60 \mu\text{g m}^{-3}$  are underlined; these sites indicate that the hourly objective is potentially exceeded.

The overall data capture rates for the 42 diffusion tube monitoring sites during 2012 was high (exceeding 93%). These 42 sites included 8 co-located sites. The results for all sites with less than 12 months data capture were annualised using factors derived from nearby LAQN background sites. The factors ranged from 0.92 to 1.16, with the majority between 0.97 and 1.02, indicating a small adjustment only.

Two sites were located at urban background locations (GW37 and GW40) and the results met the objective, with concentrations ranging around  $25 \mu\text{g m}^{-3}$ . Of the three sites described as intermediate, two met the objective (i.e. GW38 and the co-located GW39). The other intermediate site GW61 located at the Millennium Village on the Greenwich Peninsula exceeded the objective. This is a co-located site and the results for the automatic monitoring site GR12 were given in Table 2.3. (As noted above in this table, the continuous result for this site was borderline with a concentration exceeding  $37 \mu\text{g m}^{-3}$ . The discrepancy between the results can be explained by the lower accuracy of diffusion tubes and the bias adjustment factor for the used, which was a London based figure, rather than one based on this specific site. The other co-located sites also show a discrepancy too between site results for the same reason).

Four of the roadside sites met the annual mean objective of  $40 \mu\text{g m}^{-3}$  (GW26, 28, 31 and 60), although three of these were borderline with concentrations exceeding  $37 \mu\text{g m}^{-3}$ .

The other 33 sites (excluding co-located sites) exceeded the objective in 2012. The average concentration for these sites was  $54 \mu\text{g m}^{-3}$  indicating, for the majority, that

the objective was easily exceeded. The highest concentration arose at Plumstead Road (GW101), exceeding  $78 \mu\text{g m}^{-3}$ . Three other sites also exceeded  $70 \mu\text{g m}^{-3}$ , these were on Woolwich Road (GW35 and GW50), plus the site on Plumstead Road (GW101). (Note - this includes the co-located site at GW50).

In total 28 of these 33 sites recorded bias adjusted concentrations greater than  $45 \mu\text{g m}^{-3}$ . The Shooters Hill site GW53 had the lowest concentration (that exceeded the objective) of  $41.8 \mu\text{g m}^{-3}$ .

In previous years the number of sites exceeding the objective was 26 in 2011, 29 in 2010 and 28 in 2009 (excluding co-located sites). The mean concentrations for these years were:  $54 \mu\text{g m}^{-3}$  (in 2009);  $56 \mu\text{g m}^{-3}$  (in 2010);  $54 \mu\text{g m}^{-3}$  (in 2011) and  $55 \mu\text{g m}^{-3}$  (in 2012). All of the roadside either represent or are close to locations with relevant exposure.

In 2012, eight of the network sites (GW29, GW33, GW35, GW43, GW50, GW54, GW101 and GW102) recorded concentrations greater than  $60 \mu\text{g m}^{-3}$ , suggesting the possibility that the hourly mean objective might also be exceeded. These sites also exceeded this level in previous years and all are located either close to a road junction or close to slow moving and idling traffic where members of the public are not reasonably considered likely to spend an hour or more.

A comparison of the bias adjusted results for previous years is shown in Table 2.6. These show that for most sites (i.e. almost 70%) that concentrations were higher in 2012 than 2011 by an average of around  $3 \mu\text{g m}^{-3}$ . The Council's most recent USA also indicated that concentrations were lower in 2011 than previous years. A brief examination of the results further indicates that concentrations in 2010 were higher than the other years shown. These variations are to be expected and are considered the result of inter annual variation as a result of changes in meteorology between years rather specific changes in emissions; although a more detailed and extensive analysis is required to confirm this. The issue of recent reductions in emissions was briefly discussed in the earlier section commenting on the results of continuous monitoring.

Table 2.5 Results of NO<sub>2</sub> Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	2012 Data Capture (Number of Months) <sup>a</sup>	2012 Bias adjusted annual mean ( $\mu\text{g m}^{-3}$ ) <sup>b</sup>
GW23	Siebert Rd	Roadside	Y		12	<b>42.2</b>
GW24	Plumstead Common Rd	Roadside	Y		12	<b>54.9</b>
GW25	Eltham Rd	Roadside	Y		10	<b>47.1</b>
GW26	Foots Cray Rd	Roadside	Y		11	31.6
GW27	Charlton Village	Roadside	Y		12	<b>51.1</b>
GW28	Dunblane Rd	Roadside	Y		11	39.7
GW29	Woolwich Rd Charlton	Roadside	Y		12	<b>66.6</b>
GW30	Indus Rd	Roadside	Y		6	<b>52.0</b>
GW31	Deansfield School	Roadside	Y		12	37.9
GW32	Banchory Rd	Roadside	Y		11	<b>50.1</b>
GW33	Blackheath Hill	Roadside	Y		11	<b>64.1</b>
GW34	Bannockburn School	Roadside	Y		12	<b>48.3</b>
GW35	Woolwich Rd Greenwich	Roadside	Y		9	<b>73.2</b>
GW36	Boord St	Roadside	Y		11	<b>54.5</b>
GW37	De Lucy School	Background	Y		10	24.6
GW38	Westhorne Av	Intermediate	Y		12	37.6
GW39	Bexley Rd ECC	Intermediate	Y	Triplicate/ Co-located	12	23.8
GW40	Shrewsbury House	Background	Y		12	25.4
GW41	Sidcup Rd	Roadside	Y		12	<b>47.8</b>
GW42	Greenwich Church St	Roadside	Y		12	<b>52.5</b>
GW43	Creek Rd	Roadside	Y		12	<b>66.8</b>
GW44	Eltham High St	Roadside	Y		11	<b>50.4</b>
GW48	Greenwich South St	Roadside	Y		12	<b>47.6</b>
GW49	Woolwich High St	Roadside	Y		11	<b>48.5</b>
GW50	Woolwich Flyover	Roadside	Y	Triplicate/ Co-located	8	<b>75.9</b>
GW51	Bugsbys Way	Roadside	Y		12	<b>49.3</b>
GW52	Woolwich High St	Roadside	Y		12	<b>45.7</b>
GW53	Shooters Hill Rd	Roadside	Y		12	<b>41.8</b>
GW54	Westhorne Av	Roadside	Y		12	<b>63.6</b>
GW55	Crowns Wood Way	Roadside	Y	Triplicate/ Co-located	11	<b>58.1</b>
GW56	Sidcup Rd	Roadside	Y		12	<b>56.2</b>



Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	2012 Data Capture (Number of Months) <sup>a</sup>	2012 Bias adjusted annual mean ( $\mu\text{g m}^{-3}$ ) <sup>b</sup>
GW57	Trafalgar Rd	Roadside	Y	Triplicate/ Co-located	12	<b>41.9</b>
GW58	Blackheath Hill	Roadside	Y	Triplicate/ Co-located	10	<b>48.5</b>
GW59	Westhorne Av	Roadside	Y	Triplicate/ Co-located	12	<b>44.6</b>
GW60	Burrage Grove	Roadside	Y	Triplicate/ Co-located	12	39.0
GW61	Millennium Village	Intermediate	Y	Triplicate/ Co-located	12	<b>40.0</b>
GW101	Plumstead Rd	Roadside	Y		12	<b><u>78.8</u></b>
GW102	Plumstead Rd	Roadside	Y		12	<b><u>70.2</u></b>
GW103	Wricklemarsh Rd	Roadside	Y		11	<b>52.8</b>
GW104	Sun Lane	Roadside	Y		12	<b>58.5</b>
GW105	Cliftons Roundabout	Roadside	Y		11	<b>55.7</b>
GW106	Ground Depot Rd	Roadside	Y		9	<b>41.9</b>

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g m}^{-3}$

Underlined, annual mean > 60 $\mu\text{g m}^{-3}$ , indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> Where data capture for full calendar year less than 9 months (i.e.75%), means are “annualised” as in Box 3.2 of TG(09)

<sup>b</sup> Where exceedence is measured at a monitoring site not representative of public exposure, NO<sub>2</sub> concentration at the nearest relevant exposure estimated using the “NO<sub>2</sub> fall-off with distance” calculator and results discussed. The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09).

Table 2.6 Results of NO<sub>2</sub> Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Bias adjusted Annual Mean Concentration ( $\mu\text{g m}^{-3}$ ) <sup>a</sup>				
			2008 (Bias Adjustment Factor = 0.93)	2009 (Bias Adjustment Factor = 0.95)	2010 (Bias Adjustment Factor = 1.06)	2011 (Bias Adjustment Factor = 1.02)	2012 (Bias Adjustment Factor = 1.04)
GW23	Roadside	Y	45.7	42.8	48.6	39.4	42.2
GW24	Roadside	Y	56.2	51.1	58.3	53.1	54.9
GW25	Roadside	Y	53.1	53.6	55.5	48.0	47.1
GW26	Roadside	Y	44.1	42.8	37.5	32.5	31.6
GW27	Roadside	Y	50.3	51.6	53.8	46.1	51.1
GW28	Roadside	Y	-	38.8	40.8	37.8	39.7
GW29	Roadside	Y	<u>67.4</u>	<u>70.7</u>	<u>70.7</u>	<u>65.0</u>	<u>66.6</u>
GW30	Roadside	Y	-	38.1	41.7	37.9	52.0
GW31	Roadside	Y	-	32	35.1	34.5	37.9
GW32	Roadside	Y	44.2	48.3	50.9	47.8	50.1
GW33	Roadside	Y	<u>63.0</u>	<u>59.8</u>	<u>67.1</u>	<u>59.2</u>	<u>64.1</u>
GW34	Roadside	Y	47.6	51.3	52.1	48.2	48.3
GW35	Roadside	Y	<u>71.9</u>	<u>74.4</u>	<u>73.8</u>	<u>71.5</u>	<u>73.2</u>
GW36	Roadside	Y	54.2	54.2	46.0	52.6	54.5
GW37	Background	Y	25.7	28	26.5	28.9	24.6
GW38	Intermediate	Y	37.2	36.9	38.6	36.2	37.6
GW39	Intermediate	Y	23.5	25.1	25.4	23.1	23.8
GW40	Background	Y	24.2	22.5	25.4	22.6	25.4
GW41	Roadside	Y	45.1	45	47.2	48.5	47.8
GW42	Roadside	Y	55.8	58.1	59.8	56.0	52.5
GW43	Roadside	Y	57.5	59.1	<u>61.6</u>	<u>62.3</u>	<u>66.8</u>
GW44	Roadside	Y	55.4	<u>61.1</u>	<u>70.5</u>	48.4	50.4
GW48	Roadside	Y	49.4	47.1	49.2	47.4	47.6
GW49	Roadside	Y	42.4	50.3	46.3	43.7	48.5
GW50	Roadside	Y	<u>67.6</u>	<u>75.3</u>	<u>72.6</u>	<u>75.5</u>	<u>75.9</u>
GW51	Roadside	Y	48.2	50.5	47.1	41.9	49.3
GW52	Roadside	Y	47.4	44.8	54.4	48.5	45.7
GW53	Roadside	Y	43.8	46.3	44.9	43.3	41.8

Site ID	Site Type	Within AQMA?	Bias adjusted Annual Mean Concentration ( $\mu\text{g m}^{-3}$ ) <sup>a</sup>				
			2008 (Bias Adjustment Factor = 0.93)	2009 (Bias Adjustment Factor = 0.95)	2010 (Bias Adjustment Factor = 1.06)	2011 (Bias Adjustment Factor = 1.02)	2012 (Bias Adjustment Factor = 1.04)
GW54	Roadside	Y	56.7	<u>60.6</u>	<u>61.2</u>	<u>60.8</u>	<u>63.6</u>
GW55	Roadside	Y	49.1	51	58.8	53.2	58.1
GW56	Roadside	Y	58.6	56.1	64.2	53.5	56.2
GW57	Roadside	Y	42.3	43.6	46.7	43.1	41.9
GW58	Roadside	Y	48.8	47	52.3	50.7	48.5
GW59	Roadside	Y	43.9	44.6	54.8	44.3	44.6
GW60	Roadside	Y	43.3	41.6	46.4	41.3	39.0
GW61	Intermediate	Y	42.4	42.2	41.0	40.7	40.0
GW101	Roadside	Y	<u>77.3</u>	<u>78.7</u>	<u>79.8</u>	<u>85.3</u>	<u>78.8</u>
GW102	Roadside	Y	<u>67.4</u>	<u>67.6</u>	<u>68.5</u>	<u>65.3</u>	<u>70.2</u>
GW103	Roadside	Y	-	44.7	45.8	47.7	52.8
GW104	Roadside	Y	-	50.3	50.4	55.2	58.5
GW105	Roadside	Y	-	54.9	<u>72.4</u>	51.0	55.7
GW106	Roadside	Y	-	43.5	45.0	43.8	41.9

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g m}^{-3}$

Underlined, annual mean > 60 $\mu\text{g m}^{-3}$ , indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> Means “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), where full calendar year data capture was less than 75%

### 2.2.2 Particulate Matter (PM<sub>10</sub>)

The TG09 guidance highlights that any PM<sub>10</sub> monitoring undertaken must conform to criteria relating to the gravimetric European reference method or its approved equivalent. The majority of the monitoring sites in the Royal Borough use FDMS analysers, which was found to be equivalent. Some other sites use TEOM instruments, which were not found to meet the equivalence criteria, without correction. Previously for the TEOM a correction using a factor of 1.3 was accepted; now however the VCM (Volatile Correction Model) has been adopted for this purpose.

This method is based on the assumption that the volatile component of PM<sub>10</sub> lost during the heated sampling of PM with the standard TEOM is consistent across a defined geographical area. The model uses the FDMS purge measurement as an indicator of this volatile component. As FDMS instruments have met the equivalence criteria, the VCM correction is also considered equivalent to the European reference method.

The results for the Greenwich sites are reported below as **reference equivalent**, these represent either FDMS measurements (where no correction has been made) or TEOM measurements that were corrected using the VCM. The data are all fully ratified other than for 2013, which includes provisional data.

All of the Greenwich monitoring sites met the annual mean objective for the 2009 to 2013 period shown in Table 2.7. The highest annual mean concentration monitored was at the GR8 site close to the Woolwich Flyover in 2009, when the measured concentration approached the objective, recording 37  $\mu\text{g m}^{-3}$ . This site is located close to the busy A102 (M) Blackwall Tunnel Approach and previously exceeded this objective in 2008 (see earlier Royal Greenwich air quality reports). Concentrations have since reduced to around 33  $\mu\text{g m}^{-3}$  but are still the highest levels measured in the Royal Borough due to the proximity of road traffic.

Two other sites also recorded annual mean concentrations greater than 30  $\mu\text{g m}^{-3}$  in 2013; the GR7 site on Blackheath Hill and GN4 site at Fiveways. The GR7 and GR8

sites represent relevant exposure as the monitoring sites are close to facades of nearby residential premises. The GN4 site is five metres closer to the kerb than the façade. All other sites recorded annual mean concentrations between 20 and 28  $\mu\text{g m}^{-3}$ , with the suburban background site at Eltham (GR4) recording the lowest concentrations.

The daily mean objective, which has been exceeded more widely across the UK than the annual mean objective, is reported in Table 2.8. The monitoring results for the GR8 roadside site at the Woolwich flyover show that the daily mean objective of not more than 35 days with a mean 24-hour concentration greater than 50  $\mu\text{g m}^{-3}$  was exceeded for two of the five years shown and closely approached for two other years when 33 days exceeded. In 2013 the number of days that exceeded was 23 days, this reduction is also reflected in the annual mean concentration which reduced slightly too in 2013. Further detailed analysis, which is beyond the scope of this report, is necessary to confirm whether or not this is as a result of interannual variations due to meteorology or a reduction in emissions.

The GR7 site on Blackheath Hill exceeded the objective in 2011 only, as did the GB0 site at Falconwood in 2013 (based on the 90.4<sup>th</sup> percentile of 24 hour mean measurements). The GN4 site at Fiveways also exceeded the objective in 2012 and 2013. In 2011 it closely approached the objective. (These assessments for GN4 were all based on the 90.4<sup>th</sup> percentile).

All other Greenwich sites had some periods when the daily standard of 50  $\mu\text{g m}^{-3}$  was exceeded. This was mostly 10 days or less. For 2011 however the sites had an increased number of days that exceeded compared to previous years. This was mainly as a result of the episodes that arose in the early part of the year and also during November. These peaks in  $\text{PM}_{10}$  concentrations occur during periods of stable conditions, specifically during winter London sources can dominate concentrations, at other times high pressure systems can lead to imported transboundary  $\text{PM}_{10}$  from elsewhere in the UK and Europe.

The concentrations measured in Greenwich are considered typical of those measured elsewhere across London (KCL, 2012).

**Table 2.7 Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration ( $\mu\text{g m}^{-3}$ )				
						2009	2010	2011	2012	2013 <sup>c</sup>
Eltham (GR4)	Suburban	Y	N/a	90	Y	26	23	23	20	20
Trafalgar Road (GR5)	Roadside	Y	N/a	100	Y	21	22	23	23	22
Blackheath Hill (GR7)	Roadside	Y	N/a	91	Y	24	28	32	28	30
Woolwich Flyover (GR8)	Roadside	Y	N/a	99	Y	37	33	35	33	31
Westthorne Avenue (GR9)	Roadside	Y	N/a	91	Y	23	22	23	20	24
Burrage Grove (GN0)	Roadside	Y	N/a	81	Y	25	28	28	27	28
Millennium Village (GN2)	Industrial background	Y	N/a	77	Y	20	22	25	23	26
Plumstead High St (GN3)	Roadside	Y	N/a	65	Y	20	20	22	21	19 (18)
Falconwood (GB0)	Roadside	Y	N/a	65	Y	23	27	27	26	29 (28)
Fiveways Sidcup Road (GN4)	Roadside	Y	N/a	82	Y	-	-	30	30	31

In bold, exceedence of the PM<sub>10</sub> annual mean AQS objective of 40µg m<sup>-3</sup>

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

<sup>c</sup> Means “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), as valid data capture was less than 75%

**Table 2.8 Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with 24-hour Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2013 % <sup>b</sup>	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg m <sup>-3</sup>				
						2009	2010	2011	2012	2013 <sup>c</sup>
Eltham (GR4)	Suburban	Y	N/a	90	Y	11	4	22	9	5
Trafalgar Road (GR5)	Roadside	Y	N/a	100	Y	4	2	18	16	6
Blackheath Hill (GR7)	Roadside	Y	N/a	91	Y	12	20	<b>41</b>	26	26
Woolwich Flyover (GR8)	Roadside	Y	N/a	99	Y	<b>44</b>	33	<b>42</b>	33	23
Westthorne Avenue (GR9)	Roadside	Y	N/a	91	Y	13	9	25	16	17
Burrage Grove (GN0)	Roadside	Y	N/a	81	Y	0	18	32	28	22
Millennium Village (GN2)	Urban background	Y	N/a	77	Y	12	9	25	20	20 (46)
Plumstead High St (GN3)	Roadside	Y	N/a	65	Y	6	7	16	8	3 (34)
Falconwood (GB0)	Roadside	Y	N/a	65	Y	9	16	25 (47)	27	21 (50)
Fiveways Sidcup Road (GN4)	Roadside	Y	N/a	82	Y	-	-	26 (49)	24 (54)	32 (53)



In bold, exceedence of the PM<sub>10</sub> daily mean AQS objective (50µg m<sup>-3</sup> – not to be exceeded more than 35 times per year)

<sup>a</sup> i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

<sup>b</sup> i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

<sup>c</sup> as data capture for full calendar year was less than 90%, the 90.4<sup>th</sup> percentile of 24-hour means in brackets is included

### 2.2.3 Sulphur Dioxide (SO<sub>2</sub>)

Automatic monitoring of SO<sub>2</sub> is undertaken at one representative site in the Royal Borough; at the suburban site in Eltham (GR4). The results for 2013 are given in Table 2.9 below. These show that there were no periods that exceeded the 15 minute, hourly or 24 hourly standards of the UK AQS objectives. The results for the period from 2008 also recorded no periods when these standards were exceeded. As a consequence the AQS objectives were not exceeded and an AQMA for SO<sub>2</sub> has not been declared.

**Table 2.9 Results of Automatic Monitoring for SO<sub>2</sub>: Comparison with Objectives**

Site ID	Site Type	Within AQMA?	Valid Data Capture 2013 %	Number of:		
				15-minute Means > 266µg m <sup>-3</sup>	1-hour Means > 350µg m <sup>-3</sup>	24-hour Means > 125µg m <sup>-3</sup>
Eltham (GR4)	Suburban	N	91	0	0	0

### 2.2.4 Benzene

Benzene monitoring was undertaken using diffusion tubes at three sites. The sites were co-located with the nitrogen dioxide tube sites as described earlier. The annual mean results for the period 2009 to 2012 are given in Table 2.10. Data capture for the sites in 2009 was over 96%, 50% in 2010 and 83% in 2011.

The monitored results indicate that the 2003 AQS objective (of 16.25 µg m<sup>-3</sup>) was not exceeded during the period of monitoring. The benzene monitoring also confirms that the stricter 2010 objective (of 5 µg m<sup>-3</sup>) was also not exceeded at any of the sites over this period. The Council's previous reports highlights that concentrations have reduced over time. The monitoring reported here indicates that concentrations decreased between 2009 and 2012 at the three monitored sites (two roadside and one background). This is due to the continuing effects of stricter emission controls, particularly with regard to road transport sources.

**Table 2.10 Results of Automatic Monitoring of Benzene (annual mean  $\mu\text{g m}^{-3}$ )**

Site ID	Site Type	Within AQMA?	2009	2010	2011	2012
GW39 (mean)	Background	N	1.6	<i>1.1</i>	1.3	<i>2.0</i>
GW42	Roadside	N	2.2	<i>1.6</i>	1.8	<i>1.8</i>
GW50	Roadside	N	2.7	<i>1.6</i>	2.1	<i>2.5</i>

(Note – italics represents < 75% data capture)

### 2.2.5 Ozone monitoring

The Council undertook the continuous measurement of ozone at its background site in Eltham GR4, plus four roadside sites at Falconwood GB6, Woolwich Flyover GR8, Westthorne Avenue GR9 and Plumstead High Street GR13. The results for the period 2009 – 2013 are given in Table 2.11. The data capture for all years exceeded 90%; except GR9 site in 2009.

The Government's air quality objective, not to exceed 10 periods in a calendar year, was exceeded only at the background site during the period reported. This was during 2011 and 2012, although the objective was approached in the other years reported too, including 2009, 2010 and 2013.

The LAQN annual mean index for ozone (which is based on an average of selected sites dependant on type and availability of data) has also shown that since 1996 through to the end of 2007 a 37% increase in levels (ERG, 2009). Thus this confirms that concentrations of ozone have increased across London.

The roadside sites all met the objective for the period shown, although GN3 exceeded the objective previously (see earlier reports). Lower ozone concentrations are normally expected at roadside sites as higher concentrations of NO<sub>x</sub> lead to a local depletion of ozone concentrations. However the decrease in NO<sub>x</sub> emissions within London has led to an increase in ozone concentrations. This can be partially seen by the number of periods shown at the roadside sites since 2011. With diminishing NO<sub>x</sub> concentrations, it is likely that future ozone concentrations in London will more closely resemble those in surrounding rural areas. It is this

decrease in NOx concentrations in London that is thought to be the main cause of the increase in annual mean ozone. The roadside sites monitoring ozone continue to provide an understanding of oxidation close to polluted areas and also future changes over time.

**Table 2.11 Number of daily maxima exceeding 100 µg m<sup>-3</sup> based on 8-hour running mean (2009-2013)**

Objective	2009	2010	2011	2012	2013
GR4	8	7	<b>15</b>	<b>10</b>	9
GB6	0	0	6	6	3
GR8	0	0	1	4	0
GR9	<i>0</i>	0	3	5	2
GN3	0	0	1	1	0

(Note - italics indicates < 90% data capture; bold exceeds the objective)

### 2.2.6 PM<sub>2.5</sub> monitoring

The Council undertook the continuous measurement of PM<sub>2.5</sub> at eight of its sites, including the BX3 suburban site in Thamesmead. The sites all used FDMS instruments, apart from the BX3 site, which used a TEOM instrument.

The unadjusted annual mean results for the monitoring sites are given in Table 2.12.

**Table 2.12 PM<sub>2.5</sub> annual mean results (µg m<sup>-3</sup>) (2009 - 2013)**

Objective	2009	2010	2011	2012	2013
GR4	17.6	16.6	16.1	13.3	14.6
GR8	18.6	16.4	17.2	15.4	14.9
GR9	15.5	17.1	17	15.8	16.9
GN0	19.8	19.7	24.5	18.1	18.3
GN2	15.4	16.4	19.1	15.2	15.5
GN3	14.2	15.1	18.7	19.1	15.1
GB0	16.8	18.2	17.8	18.6	16.2
BX3	9.7	9.4	9.8	9	9.5

(Note - italics indicates < 90% data capture)

Reviews by the WHO and the Committee on the Medical Effects of Air Pollutants (COMEAP) suggested exposure to PM<sub>2.5</sub> gives a stronger association with the observed ill-health effects of particles. It is also noted that there is evidence that the coarse fraction between (PM<sub>10</sub> – PM<sub>2.5</sub>) has some effects on health (Defra, 2007).

As a consequence of this a PM<sub>2.5</sub> objective was included in the 2007 Air Quality Strategy. This is based on the health advice for PM<sub>2.5</sub>, which shows that there is no accepted threshold effect, i.e. there is no recognised safe level for exposure to fine particles. As a result in its strategy, the Government adopted an ‘exposure reduction’ approach for PM<sub>2.5</sub> to seek a more efficient way of achieving further reductions in the health effects of air pollution. This is intended to provide a driver to improve air quality everywhere in the UK rather than just in a small number of localised hotspot areas.

The exposure reduction approach is based on the principle that for a pollutant with a low or no threshold for adverse effects, it will generally be more beneficial to public health, and potentially more cost-effective to reduce pollutant levels across the whole population of an urban area or region rather than in a small area or “hotspot”. The framework of delivering this approach contains two inseparable parts:

- Air quality objectives/limit values (often called “backstop objective” or “concentration cap”) to ensure some basic level or quality of air which all citizens should experience, embodying the “environmental justice” concept
- An objective based on reducing average exposures across the most heavily populated areas of the country (often called “percentage reduction” or “exposure reduction” objective), to generate further cost effective public health improvements over and above the basic level of protection generated by the objective above.

While the percentage reduction objective is a relative measure of improvement (in this strategy, it is a 15 per cent reduction in average concentrations in urban background areas across the UK between 2010 and 2020), the backstop objective (or concentration cap) is designed to deliver a minimum level of protection applicable to all areas i.e. 25µg m<sup>-3</sup> as an annual mean.

The above results for the Greenwich sites include results from FDMS instruments (plus one TEOM instrument). The results for the FDMS instruments meet the equivalence criteria (as for PM<sub>10</sub>). However the PM<sub>2.5</sub> data for the BX3 site are reported without adjustment to a gravimetric equivalent.

The measurement results for all years and sites indicate that the backstop objective was not exceeded, although it was approached in 2011 at the GN0 site in Burrage Grove. All other sites measured annual mean concentrations between 13 and 20 µg m<sup>-3</sup>. There were higher concentrations at the roadside sites, with the BX3 suburban site recording (unadjusted) concentrations just less than 10 µg m<sup>-3</sup>.

### 2.2.7 Summary of Compliance with AQS Objectives

The Royal Borough of Greenwich has examined the recent results from monitoring in the Royal Borough. Concentrations of NO<sub>2</sub> and PM<sub>10</sub> still exceed the objectives for these pollutants at roadside and nearby locations for much of the Royal Borough, consequently the borough wide AQMA should remain for these pollutants.

Concentrations for SO<sub>2</sub> and benzene however are all below the objectives; therefore there is no need to proceed to a Detailed Assessment for these two pollutants.

Note - Ozone and PM<sub>2.5</sub> are not LAQM pollutants and these are presented for information only.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

No new potential road traffic sources, such as those listed below, have been identified since the 2012 Updating and Screening Assessment:

- Narrow congested streets with residential properties close to the kerb.
- Busy streets where people may spend one hour or more close to traffic.
- Roads with a high flow of buses and/or HGVs.
- Junctions.
- New roads constructed or proposed since the last Updating and Screening Assessment.
- Roads with significantly changed traffic flows.
- Bus or coach stations.

### **3.2 Other Transport Sources**

No new potential other transport sources, such as those listed below, have been identified since the 2012 Updating and Screening Assessment:

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.
- Ports for shipping.

### **3.3 Industrial Sources**

No new potential industrial sources, such as those listed below, have been identified since the 2012 Updating and Screening Assessment (the updated list of permitted installations are listed in the Appendix):

- Industrial installations: new or proposed installations for which an air quality assessment has been carried out.
- Industrial installations: existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- Industrial installations: new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

### **3.4 Commercial and Domestic Sources**

No new potential commercial and domestic sources, such as those listed below, have been identified since the 2012 Updating and Screening Assessment:

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant
- Areas where domestic solid fuel burning may be relevant.

### **3.5 New Developments with Fugitive or Uncontrolled Sources**



No new potential sources of fugitive or uncontrolled particulate matter, such as those listed below, have been identified since the 2012 Updating and Screening Assessment:

- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.
- Waste transfer stations, etc.
- Other potential sources of fugitive particulate emissions.

The Royal Borough of Greenwich Council confirms that there are no new or newly identified local developments, which may have an impact on air quality within the Royal Borough.

## **4 Local / Regional Air Quality Strategy**

The GLA launched two Supplementary Planning guidance drafts in 2013 and these addressed:

Construction and Demolition Supplementary Planning guidance; including proposals for a new Non-road Mobile Machinery LEZ;

Sustainable Design and Construction Supplementary Planning guidance; including detailed guidance on the implementation of the “air quality neutral” provisions of the London Plan and minimum emission standards for combined heat and power (CHP) and biomass plant.

The Council will use these with development proposals in the Royal Borough.

## 5 Planning Applications

The Local Development Framework or LDF is the name given to the planning documents which collectively deliver the spatial planning strategy and policies for the local area by building upon existing local and regional strategies.

The Royal Borough of Greenwich's Local Development Framework is made up of the following documents:

- Core Strategy with Development Management Policies - This document sets out the strategic objectives for Royal Greenwich as well as the more detailed development management policies and the implementation framework required to deliver the strategy.
- Site Specific Allocations – This document will support the Core Strategy by identifying specific sites that are important to delivering the vision set out in the Core Strategy. This will include large sites that will deliver a significant amount of development, such as for housing or employment space.

Royal Borough of Greenwich's existing and emerging development plans are complemented by Supplementary Planning Documents (SPDs) and other guidance. These documents are not part of the statutory development plan but are a material consideration in planning applications. The following SPDs have been produced to date.

- Thamesmead and Abbey Wood SPD
- Prepared jointly with Bexley Council and formally adopted on 31 December 2009.
- Kidbrooke Area SPD
- Prepared to help guide the development of Kidbrooke Village, a large area of growth and regeneration in the Borough on the site of the former Ferrier Estate.
- Planning Obligations SPD

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- Provides detailed guidance on the type and scale of planning obligations for development proposals within Royal Greenwich.
- Woolwich Town Centre Masterplan SPD
- Prepared to help guide development in Woolwich Town Centre. Adopted on 12 April 2012.
- Eltham Town Centre Masterplan SPD
- Prepared to help guide development in Eltham Town Centre. Adopted on 12 April 2012.
- Charlton Riverside Masterplan SPD
- Prepared to help guide development at Charlton Riverside. Adopted on 12 April 2012.
- Greenwich Peninsula West SPD
- Prepared to help guide development at Greenwich Peninsula West. Adopted on 12 April 2012.

Master plans for four areas in Royal Greenwich were adopted on 12 April 2012, as follows:

Charlton Riverside  
Eltham Town Centre  
Greenwich Peninsula West  
Woolwich Town Centre.

## 6 Air Quality Planning Policies

The Royal Borough of Greenwich is a leading member of the Low Emission Strategies Partnership, which evolved from those local authorities awarded Air Quality Beacon Councils status. The Low Emission Strategies Partnership was first established in 2008, as an informal group working together to reduce road transport emissions. Since then, the Partnership have secured over £1 million in grant funding for local and national projects and played an important role in establishing low emission tools and approaches.

The Royal Borough of Greenwich acts as the body that is accountable for the Partnership, holding the financial assets and awarding contracts. Governance and scrutiny is provided by the Partnership Board, which currently includes individuals representing seven local authorities.

The Low Emission Partnership is a group of local authorities working together to protect public health, and tackle climate change, by reducing emissions from road transport. The Partnership promotes ambitious joined up action to reduce both emissions of toxic air pollutants and greenhouse gases, delivered by cost effective and practical interventions supported by robust impact assessment.

It specialises in two broad areas:

1. Accelerating the adoption of low emission transport fuels and technology and
2. Use of emission based assessment to support policy and action. It also works more widely to enable integration of its approach with complementary drivers, interventions and methods.

The overall aim is to achieve and evidence significant emission reductions from local transport. To do this the Partnership's current work programme is focussed on working with and supporting local authorities to develop and implement local air quality action plans and low emission measures. This includes:

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- Cost effective scoping of options for integrated air quality action – enabling consideration of a broad range of options, meaningful early stage engagement with stake holders, setting of high level objectives and identification of integrated packages of action capable of achieving them.
- Planning agreements that support low emission development by reducing transport emissions.
- Fleet management plans, licensing controls and procurement criteria, which accelerate fleet uptake of low emission technologies and increase low emission fleet management and driver training practices.
- Giving access to and supporting use of practical methods and tools for quantifying impacts, justifying individual measures and supporting negotiation of agreements, alongside progress on establishing assurance and certification mechanisms for low emission developments.

For more information see:

<http://www.lowemissionstrategies.org/about.html#sthash.XEoo7WLL.dpuf>

## 7 Local Transport Plans and Strategies

The second Royal Greenwich Local Implementation Plan for Transport was approved by the Mayor of London on 11 October 2011. It sets out how we propose to implement the Mayor of London's transport strategy (MTS) and the Eastern sub-regional plan within the Royal Borough and like the MTS it looks forward to 2031.

The main aim of the Local Implementation Plan's programme is to:

Increase sustainable travel capacity and opportunities for trips to and from key growth and employment centres within the Royal Borough and ensure the network enables all residents and visitors to access health, education (including 16+ establishments), employment, social and leisure facilities within and beyond the Royal Greenwich.

Other more detailed local objectives, which will deliver the aim, are to:

- Improve the condition of principal roads (to sit within the top quartile of London roads).
- Improve the health of residents by promoting Active Travel - increasing walking and cycling.
- Increase walking, cycling and public transport access by reducing crime, fear of crime and antisocial behaviour through well designed, high quality and historically sensitive public realm improvements.
- Reduce the number of people killed and seriously injured on the Borough's roads, and reduce the overall number of pedestrian and cycle casualties.
- Improve access to the Royal Borough's three Olympic and Paralympic sites and develop the legacy that this provides, including improvements to walking and cycling facilities as well as access to public transport.
- Improve transport provision and the quality of the transport environment particularly in areas that show high indices of multiple deprivations.
- Reduce Royal Greenwich's contribution to climate change and work to improve the air quality. (Reduce transport-related CO<sub>2</sub> emissions, tackle

congestion, smooth traffic flow and increase the proportion of trips made by sustainable modes).

- Continue to promote and support a package of Thames River Crossings (including the development of a fixed crossing at Gallions Reach) and the further development of passenger River Services, to improve access to key employment areas and address severance in the East of the Borough and intensification of river use overall.
- Implement Crossrail complementary measures to allow better access to already committed infrastructure.
- Work towards the implementation of express bus routes both in and beyond the Royal Borough to improve orbital links and journey times for public transport users in the Royal Borough.
- Improve North/South public transport links within the Royal Borough including the investigation of extending Docklands Light Railway services to Kidbrooke and Eltham and beyond.

At a London wide level, the Mayor for London continues to implement an ambitious package of London wide measures including LEZ standards, retiring the oldest, most polluting taxis and cleaning up the bus fleet. Together these have reduced PM<sub>10</sub> emissions by 15% and NO<sub>x</sub> emissions by 20%.

In February 2013 the Mayor also announced his intention to establish a new Ultra Low Emissions Zone in central London from 2020 to further improve air quality.

The Mayor published changes to the Local Implementation Plan (LIP) guidance, which highlighted air quality as a key consideration in the assessment criteria.



## 8 Climate Change Strategies

The Greenwich Climate Change Strategy produced in 2011 aims to address climate change through:

**Mitigation:** The action we take to limit further climate change by reducing our own, and encouraging the community to reduce their own, greenhouse gas emissions; especially carbon dioxide (CO<sub>2</sub>).

**Adaptation:** Preparing the community for the changes that are now inevitable and may increase further if we do not act now to reduce Greenhouse Gas emissions.

To achieve this, the Council has produced an Action Plan setting targets to meet regarding: Community Heating, Combined Cooling Heat and Power and district heating; Renewable energy technologies; Achieving excellent environmental standards in new developments; CO<sub>2</sub> reduction and production of efficient and renewable energy in new developments

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## 9 Implementation of Action Plans

The Council was required to implement an Air Quality Action Plan following its original designation of its AQMA under Part IV of the Environment Act 1995. The Action Plan encompassed many Council and other measures to improve air quality in the Borough; the Action Plan was set out in pursuit of the government's air quality objectives. The Council has thus met and continues to meet its obligations.

Many of the original action plan measures however require updating and enhancing, both as a result of the completion of the original task, but also in view of the changes and ongoing air quality problems that have prevented a sufficient reduction in concentration in major cities in the UK and also Europe. The Council is seeking funding to permit it to optimise and focus its air quality actions.

In addition to the above, the Mayor for London and TfL are to undertake the following measures that seek to reduce air pollution across London:

Extra hybrid buses - with 600 new Bus for London vehicles, which alongside a new commitment to deliver another 600 conventional hybrid buses over the next three years would increase the number of hybrid buses to more than 1,600 by 2016

New Euro Standard 6 buses - the £18m programme to retire the last 900 Euro 3 standard buses in London so that all of TfL's bus fleet will be of Euro 4 Standard or better for NOx emissions by the end of 2015

Measures to clean up construction sites - these sites are responsible for around 12 per cent of London's NOx emissions and to tackle that the Mayor will introduce a new Low Emission Zone for construction machinery. The standards will be agreed with the construction industry and will be consulted on as part of new Supplementary Planning Guidance (referred to earlier).

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The following table provides an update on the revised Royal Greenwich Air Quality Action Plan. It highlights that all original actions have been either fully completed or part of the Council's ongoing commitments and duties.

**Table 9.1 Action Plan Progress**

No.	Action	Status	Follow – up Action	Key Indicators /Monitoring/ Quantification
1	Greenwich Council will continue to implement all measures required of London Boroughs in the Mayor’s Air Quality Strategy (MAQS)	Ongoing	Latest MAQS released on 14/12/10. Low Emission Strategy Partnership featured. RBG referenced as a case study within the Report. Continue implementation of all measures in MAQS.	Monitor measures being met as required by the MAQS.
2	Greenwich Council fully supports the London Low Emission Zone (LEZ)	Ongoing	GLA responsibility. LEZ was introduced in February 2008. Included phased implementation for different category vehicles. Mayor confirmed that the LEZ now affects larger vans, minibuses, motor caravan and other specialist vehicles from 3 <sup>rd</sup> January 2012. Publicize LEZ restrictions on Greenwich website.	Effectiveness of LEZ monitored by TfL (e.g. level of compliant vehicles). TfL use RBG air quality monitoring data to quantify emission changes associated to new phases of LEZ restrictions. LEZ restrictions publicised - <a href="http://www.royalgreenwich.gov.uk/info/413/pollution_control-air_quality/588/low_emission_zone">http://www.royalgreenwich.gov.uk/info/413/pollution_control-air_quality/588/low_emission_zone</a>
3	Greenwich Council will implement the Mayor’s Transport Strategy at a local level through the Local Implementation Plan.	On-going	New LIP has been through internal consultation process and approved by TfL and Mayor of London.	Each action/ measure in the Transport Strategy and LIP will be fully implemented
4	Greenwich Council will work with Transport for London and Highways Agency in seeking significant reductions in vehicle emissions on the A102 and the Transport for London Road Network (TLRN)	On-going	TfL have overall responsibility of TLRN. RBG working towards demand management/ pedestrianisation scheme in Greenwich Town Centre with TfL consultation. RBG will support road cleaning and dust suppression techniques on TfL roads around specific identified areas such as Blackwall Tunnel.	Air quality monitoring alongside TLRN roads (e.g. Woolwich Flyover and Blackheath Hill) will indicate change/ effectiveness in pollutants emissions.
5	Greenwich Council will support and continue to work with Thames Gateway London Partnership	On-going	A public transport accessibility program is in progress that results in improved access to stations and bus stops using TfL funding.	Monitor % change in traffic counts and vehicle modes through screen line data, including cycle use. Compare with

	(TGLP) to secure improvements in public transport so as to reduce car dependency and implement measures that will improve air quality in the Borough.		Greenwich is member of TGLP. TfL and RBG have succeeded in projects such as Crossrail, DLR extensions, tube modernisation and other public transport modes as achievements. TGLP support cross-borough working to improve access to sustainable transport.	previous years data.
6	Greenwich Council promotes walking as a healthy and viable alternative to car transport and will promote cycling as a viable alternative to the car, including the provision of appropriate routes and facilities and during term time through Sustainable School Travel Programs (STPs)	On-going	Walking strategy implemented under LIP. Improved crossings/ riverside footpaths/ signage. Support the LCN and LCN+ programs. RBG supports a cycle training program with Bikeability. STPs, funded through LIP, promote walking/ cycling for schools by increasing number of pupils, families and staff walking/ cycling to school. STPs support the walking strategy by working towards improving the walking infrastructure on route to school (lighting, surfacing, crossing facilities, and therefore usage on all new developments and existing walking routes). Health Authority also funding new post to support this measure. Bikeability training for pupils, free for all residents. Bike clubs set up and implemented cycle parking facilities through the Mayor's Cycle Parking scheme. STPs have implemented Walk on Wednesdays and also support schools running their own walking campaigns during National Walk to School week and month, as well as throughout the year. Between 2007- 2010 there was a decrease in single car use by 5.7% in schools.	Monitor levels of single car use in schools, uptake of cycle training, newly trained pupils and general public, and number of new bike clubs. Quantify modal shift from car use to sustainable forms of transport through STP's. Monitor increased length of new cycle routes installed.
7	Greenwich Council will continue to implement Home Zones and 20 mph areas, both as a traffic restraint to prevent 'rat running' and to put the needs of the pedestrian, mobility impaired, cyclists and children before	On-going	One Home Zone installed. Now only 20 mph zones. The Council has an ongoing programme of 20 mph zones in existing residential areas (2 zones in 2011, another 2 in 2012, all to be implemented by 2014). Opportunities are taken on new	Monitor and quantify increase of Home Zones and 20mph areas. Review and monitor accident data of 20mph zones and non-20mph zones.

## Royal Borough of Greenwich

	those of the motorist.		developments to introduce the Home Zone concept. Best value review of 20mph zones is currently taking place.	
8	Greenwich Council will assess and help large employers in the Borough develop and implement Transport Plans.	On-going	All major planning applications have to incorporate sustainable modes of travel such as travel planning, car clubs and monitoring. These include service and delivery strategies. Secured through planning conditions and obligations.	Monitor/ quantify the level of agreed transport plans and car club members and bays.
9	Greenwich Council will seek the further promotion of bus travel through bus service reliability targets set in LIP	On-going	The Council works closely with TfL on the provision of and improvement of bus services.	Monitor the excess wait times for buses as given in the LIP target.
10	Greenwich Council will continue to work with Network Rail and rail operators to secure continuing improvements of the rail service provided to the Borough	On-going	Crossrail secured for Abbey Wood and Woolwich Arsenal station. Lobbying will be made for any additional extensions or other plans of benefit to RBG.	Monitor number of improvements made to rail network/ service in RBG.
11	Greenwich Council believes that the river Thames is an under used sustainable transport resource and will continue to promote the transportation of people and goods by the river and also continue to protect wharves where viable for the shipment of freight.	On-going	Pier at Woolwich and the QE2 pier near the O2 arena. RBG encourage all major planning proposals close to river to utilise wharves wherever possible for delivery of good, material etc. Currently part of planning process included in the UDP (LDF)	Continue monitoring the number of passengers using the river bus/boat services.
12	Greenwich Council is committed to the development of the Greenwich Waterfront Transit system and will continue to work with Transport for London towards the ultimate development of a tram system.	On-going	The GWT scheme is no longer funded but the Council is working with TfL and a consultancy to evaluate and implement some of the benefits and maintain reserved land for possible future use for an alternative scheme	Compare and monitor journey times of existing bus routes on improved facilities.
13	Greenwich Council will seek to meet the requirements of the Road Traffic Reduction Act in the Borough through the variety of measures discussed in the Council's Local Implementation Plan.	On-going	The LIP ongoing to 2014, regular review of LIP carried out by internal departments.	Regular monitoring of LIP targets and other relevant data.

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14	Greenwich Council will use its Parking Strategy to control parking on new developments whilst also discouraging commuter parking and other less essential trips.	On-going	RBG's Parking Enforcement Plan (in LIP) sets policies to control commuter parking and limit onsite parking on new developments. RBG initiated a successful car club in west of the Royal Borough, clubs now also available in Royal Arsenal and secured for new Kidbrooke Development. Greenwich LDF policy promotes car-free developments and states maximum 1 car space per unit for new residential developments.	Monitor and quantify data from car club uptake. Monitor subscriptions of car club members at existing sites.
15	Greenwich Council will maintain the Romney Road 7.5 tonne Lorry Ban in order to protect Greenwich Town Centre from air pollution and vibration.	On-going	Successful Lorry Ban still in place.	Continuous AQ monitoring station installed since 1997 to monitor effect of measure.
16	Greenwich Council will continue to implement traffic restraint measures to help create optimum driving conditions for the prevention of air pollution and to direct heavy good vehicles away from residential areas.	On-going	RBG is ensuring that road space is maximised for the benefit of all road users i.e. pedestrians, cyclists, public transport freight as well as private motor vehicles. Collaborative work with Highways department ongoing. Greenwich's Transport Planning Department have employed a consultancy to develop a freight strategy which may include better signs to reduce wasted mileage	Air quality monitoring data quantifies change in emissions associated to road use by vehicles.
17	Greenwich Council will seek to develop Freight Quality Partnerships in line with guidance produced by the Mayor for London.	On-going	RBG supports the Mayor's Freight Plan and will also continue to work with Thames Gateway sub-regional group on the freight quality partnership. Freight consolidation centres to be investigated.	Monitor level/ number of freight improvement schemes
18	Greenwich Council will seek to work with TfL, London Councils and the London Boroughs in reviewing the London Night Time Lorry Ban	On-going	Still in force - the Council is participating in TfL reviews. Promotion of bio methane vehicles to be exempt from night time lorry ban being sought by the Anaerobic Digestion and Biogas Association 'Transport Working Group'.	Monitor progress of review and work undertaken.
19	Greenwich Council will continue to monitor and consult on significant	On-going	Planned long-term. The Council is examining the feasibility of possible changes in traffic	Monitor and quantify traffic flow and associated air quality with varying

	transport schemes and measures, including those to significantly reduce traffic levels such as those in Greenwich Town Centre.		routes. EH consult on all major planning applications. Full time pedestrianisation of Greenwich Town Centre under discussion with TfL.	schemes.
20	Greenwich Council will enforce the new powers laid down in The Road Traffic (Vehicle Emissions)(Fixed Penalty)(England) Regulations 2002, in conjunction with the Vehicle Inspectorate, London Councils and the London Boroughs	On-going	Vehicle emissions testing can be conducted on public highway. This raises awareness of vehicle emissions to drivers. Monitoring is effective dependant on funding and resources.	Monitor level of testing on annual basis.
21	Greenwich Council will continue to regularly service and maintain all fleet vehicles to a high standard	On-going	Vehicles are subject to service schedules that comply with Operators Licence requirements and also manufacturers recommendations. The total no. of the RBG's fleet vehicles is 630. Vehicles within scope of LEZ regulations are 450, 75% of which are compliant.	Monitor fleet fuel consumption and % change in emissions from fleet vehicles/ annum.
22	Greenwich Council will encourage and pursue the uptake of low emission vehicles, fuels and technologies such as a bio methane refuelling station at Birchmere Depot and electric vehicle charging points located around the borough.	On-going	12-month bio methane refuelling facility trialled from 04/2011 with 2 gas vehicles. Trial hoped to inform potential viability of future permanent gas refuelling station. All Council vehicles currently operate on ULS diesel and are Euro IV compliant or better. RBG fleet uses Chemcoal fuel additive to increase performance and lower emissions. 12 publicly accessible electric vehicle charging points operational from January 2011, with free electricity incentive to all on-street charging points until 2013. All new major developments are required to implement Low Emission Strategies through S106 agreements including installation of electric charging points.	Monitor use of council owned electric charging points and use data to consider increasing network. Quantification of emission reductions from gas trial to be reported - Potential to expand trial and/ or implement permanent station.
23	Greenwich Council will continue to clean Borough roads which will help to remove dirt with the potential for re-suspension	On-going	Highway litter and detritus measured by Cleansweep department in line with Defra's National Indicator 195. Targets set to 2013 to increase cleaning effectiveness.	Cleansweep department quantify and report on NI195, including meeting targets being met for highway detritus and litter.



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24	Greenwich Council will continue to operate a free-collection, community composting scheme which has the potential for reducing the level of garden bonfires in the Borough	On-going	Greenwich achieved level of excellence and aims to increase the recycling rate to the following: - 2011/12        38% 2012/13        39% 2013/14        40% 2014/15        41%	Monitor annual rates of recycling compared to set targets
25	Greenwich Council is supporting plans for an Anaerobic Digestion (AD) facility to be located within the borough		Sending the Council's green waste collections to an AD plant has a number of environmental benefits. One of the benefits is the ability to produce renewable road transport fuel (bio methane), which emits fewer pollutants such as PM <sub>10</sub> , NO <sub>2</sub> and CO <sub>2</sub> when combusted compared to diesel. Other benefits include fewer emissions from transportation of waste, fewer methane emissions from waste to atmosphere through landfill.	Quantification of emission reductions associated to using bio methane in substitute to diesel in fleet vehicles is being completed by external consultancy.
26	Greenwich Council will continue to prevent air pollution and seek more sustainable forms of development through policies and measures contained in the LDF.	On-going	Greenwich's Core Strategy contains policies relating to Air Quality. Strategy outlines Code for Sustainable Home requirements increasing: Level 4 by 2011, Level 5 by 2013 and Level 6 by 2016. Strategy also expects BREEAM rating for 'outstanding' for non-residential developments. The Strategy requires all new development greater than 500sqm or residential development of 10 units or more to reduce CO <sub>2</sub> , PM <sub>10</sub> and NO <sub>2</sub> emissions from transport through measures set out in Defra Guidance - Low Emissions Strategies 2010.	Quantify number of residential developments achieving the BREEAM rating of 'very good' or 'excellent' and number of non-residential developments achieving 'outstanding'. Quantify number of major developments that achieve Level '3' or above of the Code for Sustainable Homes.
27	Greenwich Council will continue to require ameliorating measures such as Travel Plans, vehicle fleet improvements, low emission strategies and financial contributions to mitigate emissions via section 106 planning agreements.	On-going	Low Emission Transport Schemes implemented on all major developments. Air quality assessments required on all planning applications with increased transport movements and/or boiler emissions.	Monitor levels of agreed section 106 planning agreements which include measures such as car-free developments, installation of electric vehicle recharging points, new car club bays, car free developments, travel plans.

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28	Greenwich Council will seek to support residents in improving the energy efficiency of their homes both in the public and private sectors	On-going	Continue with the home improvement team and the handy person service. Continue with the decent homes program. Facilitate the implementation of the green deal and energy company obligation in RBG.	Monitor the uptake/installation of measures in RBG households.
29	Greenwich Council will implement its Climate Change Strategy	On-going	Climate Strategy focuses on actions to reduce CO <sub>2</sub> but will also have a beneficial impact on NO <sub>x</sub> and PM <sub>10</sub> reductions.	Annual Greenhouse Gas Report (of RBG's operational emissions and proportion of green electricity) produced by Greenwich showing CO <sub>2</sub> reductions. Annual Borough-wide per capita CO <sub>2</sub> emissions reported by DECC.
30	Greenwich Council will continue in its regulatory position to enforce Clean Air Act legislation and Statutory Nuisance under the Environmental Protection Act 1990 (particularly for dust), will continue to support the EA with ensuring all Part 'A' Processes use Best Available Techniques (BAT) and will continue to ensure that all Part B Processes in the Borough utilise BAT.	On-going	Ensure that all Part B Installations in the Borough maintain the highest standards of air pollution emission control.	RBG will ensure all inspected processes comply with their permit. Inspections will meet the minimum Defra risk rating scheme. Permit reviews will take into account local air quality objectives.
31	Greenwich Council will control dust emissions from large scale development sites by ensuring that our Protocol on Dust is adhered to alongside GLA's 'control of dust and emissions from construction and demolition'	On-going	Now use GLA document. Attached as condition to all major planning developments	Measure number of agreed major developments containing conditions of GLA and Council Protocol on dust.
32	Greenwich Council will monitor nitrogen dioxide and PM <sub>10</sub> levels throughout the Borough, supporting the London Air Quality Network and National Automatic Urban and Rural Network, and will continue to expand the automatic monitoring network where feasible.	On-going	NO <sub>2</sub> diffusion tube survey ongoing with 50+ sites. Automatic PM <sub>10</sub> and NO <sub>2</sub> at 10 sites in 2010. Work in progress to install monitor close to Blackwall tunnel entrance	Monitor the number of air quality monitors being installed. No reduction in pollution associated to this measure.
33	Greenwich Council will publicise and raise awareness of air quality	On-going	AirTEXT posters sent to PCT's and other sources to improve education and awareness	Monitor and pursue greater uptake of subscriptions to airTEXT for increased

	<p>through a number of mediums.</p>	<p>to minimise personal pollution exposure. Idling engines signs mounted on each primary school in Borough. Signs around ferry and other locations being investigated. Involvement in proactively disseminating air quality information and guidance/ advice to public to be completed at Council events.</p>	<p>awareness. Monitor level of events attended by Pollution Team to raise awareness.</p>
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## **10 Conclusions and Proposed Actions**

### **10.1 Conclusions from New Monitoring Data**

The monitoring results within the Royal Borough confirmed that the annual mean nitrogen dioxide objective continues to be exceeded at roadside and nearby locations. The sites monitored are considered to represent relevant exposure. The results also indicate that the hourly objective is potentially exceeded however there is not considered to be relevant exposure for this objective at these sites.

The Council's most recent PM<sub>10</sub> monitoring indicates that the daily mean objective has been exceeded recently within the Royal Borough at the roadside sites. Other sites within the Borough have met the objectives. A separate analysis of trends in London (KCL, 2012) confirms that concentrations do not appear to be reducing and that there is also evidence indicating that close to roadsides, PM<sub>10</sub> from primary sources may be increasing. The monitoring of sulphur dioxide and benzene confirms that the objectives for these pollutants have been met.

Based on these findings, the Council does not need to undertake a Detailed Assessment, as no new potential or actual exceedences at relevant locations were established. The Council previously designated the whole Royal Borough as an Air Quality Management Area for NO<sub>2</sub> and PM<sub>10</sub>.

### **10.2 Conclusions relating to New Local Developments**

The Council has assessed local developments of road transport, other transport, industrial processes, commercial/domestic, fugitive emissions, plus residential and commercial sources. The findings for these have indicated that there are no new changes that require the Council to undertake a Detailed Assessment.

## 10.3 Proposed Actions

This report follows the technical guidance (TG09) and fulfils this part of the continuing LAQM process.

The findings from following this methodology are that the Council has not identified a need to amend air quality boundaries and thus need not proceed to a Detailed Assessment. The findings also indicate that the AQMA should be maintained.

The Council will therefore undertake the following actions:

1. Undertake consultation on the findings arising from this report with the statutory and other consultees as required.
2. Maintain the existing monitoring programme.
3. Continue with its Air Quality Action Plan in pursuit of the AQS objectives.
4. Prepare for the submission of its next Air Quality Progress Report.

## 11 References

Defra, 2007. Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1). Defra, London. Cm 7169.

Defra, 2009a. Local Air Quality Management, Technical guidance LAQM.TG09. Defra, London.

KCL, 2012. Air Quality in London GLA Health and Environment briefing note. KCL July 2012.

Royal Borough of Greenwich, 2013. 2012 Updating and Screening Assessment for the Royal Borough of Greenwich Council.

## Appendices

### Appendix 1: Installations in Royal Greenwich permitted by the Environment Agency

Ref	Reg. Category	Name	Address	Postcode
YP3830LF	Combustion Processes	EDF Powerlink Ltd	Greenwich Generating Station, Old Woolwich Road,	SE10 9NY
WP3930UD	The disposal of waste oils (other than by incineration or landfill) in a facility with a capacity of more than 10 tonnes per day	Associated Reclaimed Oils Limited	165 Tunnel Avenue	SE10 0PW
EP-LT2170 / EAWML 83241	Waste transfer from Public Market	Royal Borough of Greenwich	Market Compound, Beresford Street	SE18
EP-LT2635 / EAWML 83240	Metal and Waste Recycling	Metal and Waste Recycling Ltd	North Site, 3 Copperas Street, Deptford	SE8 3DA
EAEPFRFP38 90EEV005 (EAWML 83317)	Mobile plant for the treatment of soils and the treatment of contaminated material, substances and products, for the purpose of remedial action.	O'Keefe Soil Remediation Limited	Mobile plant	SE10 0PU
EA/EPR/MP3 890EJ/S001 (EAWML 83239)	Metal and Waste Recycling	Concorde Metals Recycling Ltd	Unit 3/4 Building 6, Ashleigh Commercial Estate, Westmoor Street	SE7 8NQ
EP3135PE	The disposal of hazardous waste in a landfill, including biological treatment of leachate and waste discharge of site drainage to controlled waters.	Tilfen Land Limited	Licensed Facility 3, Tripcock Point	SE28 0AB
EAEPGRGP31 90LTA001 (EAWML 101457)	Inert and excavation Waste Transfer Station with treatment	S Walsh & Son Ltd	Bay Wharf, Victoria Deep Water Terminal, 231 Tunnel Avenue, Greenwich	SE10 0QE
EPR/SP3499 VG	Standard Rules SR2008No20_75kte - vehicle storage,	Mr Henry Obovu	Creekside Auto Repair Centre, Unit 7, Brookmarch Trading Estate, 70 Norman	SE10 9QE

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	depollution & dismantling (authorised treatment) facility		Road, Greenwich	
<b>EPR/FP3693 MB</b>	Storage and treatment of hazardous oil waste (mineral-based non-chlorinated insulating and heat transmission oils)	UK Power Networks Holdings Limited	Eltham Grid Sub Station, Rochester Way Relief Road	SE9 2RN
<b>EA/EPR/BP3 131HD/A001</b>	Storage and treatment of hazardous, non-hazardous and inert material. Suitable treated material will be used for the manufacture of construction materials.	Soil Xchange Ltd	Charlton Waste Treatment Facility, Building 3 and Yard, Ashleigh Commercial Estate, Westmoor Street, London	SE7 8NQ
<b>EPR/UP3990 EK/V002</b>	Storage and treatment of waste, including hazardous waste. No asbestos waste.	Toulouse Plant Hire Ltd	55-71 Norman Road, Greenwich, London	SE10 9QF
<b>EPR/WP373 1CP/A001</b>	Production of Biodiesel	Gray's Waste Services Ltd	Nathan Way, Thamesmead West, London	SE28 0AU
<b>EPR/KB3837 RZ/A001</b>	Plastic film reprocessing	Plasrecycle Ltd	Former Hunter Plastics Site, Nathan Way, London	SE28 0AB



## Appendix 2: Part B installations in Royal Greenwich

Table of permitted petrol stations in the Council's area

Ref	Name	Address	Postcode	Status
201	Asda Petrol Station	Bugsby Way, Charlton	SE7 7ST	Permitted
202	Total Fina	176 Footscray Road, New Eltham	SE9	Permitted
203	Morrison Petrol Station	Thamesmere Drive, Thamesmead	SE288RE	Permitted
204	J Sainsbury plc	Messenger Place, Eltham	SE9	Permitted
205	Star Lee S/stn	1 Sidcup Road, Lee	SE128BL	Permitted
206	Snax 24 Ltd PFS	79 Kidbrooke Park Road, Blackheath	SE3	Permitted
208	JET Service Station	177-189 Creek Road, Deptford	SE8 3OU	Permitted
210	Trafalgar Filling Station	43-45 Trafalgar Road, Greenwich	SE109TT	Permitted
211	Hexagon S/stn	340 Woolwich Road, Charlton	SE7	Permitted
213	Thamesmead S/stn	1-3 Bostall Hill, Abbey Wood	SE2 0RB	Permitted
215	Eltham Service Station	39-41 Eltham High Street, Eltham	SE9 1DH	Permitted
216	Shell Service Station	160-168 Plumstead Common Road, Plumstead	SE18 2UL	Permitted
217	Lakedale S/stn	190-214 Plumstead High Street, Plumstead	SE18 1JH	Permitted
218	Blackheath S/stn	37A Shooters Hill Road, Blackheath	SE3 7HS	Permitted
219	Shell Service Station	165 Shooters Hill Road, Blackheath	SE3	Permitted
220	Shell Service Station	Next to 551 Sidcup Road, Eltham	SE9 3AF	Permitted
221	Shell Service Station	728 Sidcup Road, Eltham SE9	SE9	Permitted
223	Shell Service Station	7-9 Tudor Parade, Well Hall Road, Eltham	SE9 5SX	Permitted
224	Clifton Service Station	59 Sidcup Road, Lee	SE12 8BL	Permitted
230	WJ King (Garages) Ltd	40 Artillery Place, Woolwich	SE184AE	Permitted
231	J Sainsbury plc	Bugsby Way, Charlton	SE10	Permitted
232	Crown Woods S/stn	Bexley Road	SE9 2NL	Permitted

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Table of Part B installations in the Council's area

Ref	Reg. Category	Name	Address	Postcode	Status
102	Cremation of Human Remains	Eltham Crematorium	Crown Woods Way, Eltham	SE9 2RF	Permitted
110	Concrete Batching	Tarmac	Murphy's Wharf, Lombard Wall, Charlton	SE7 7SH	Permitted
112	Roadstone Coating	Aggregate Industries (UK) Ltd	Angerstein Wharf, Horn Lane, Greenwich	SE100RT	Permitted
126	Ferrous and Non-Ferrous Metal Processing	Essex Replica Castings (Basildon) Ltd	108-112 Westmoor Street, Charlton	SE7 8NQ	Permitted
130	Ferrous and Non-Ferrous Metal Processing	Stone Foundries	Woolwich Road, Woolwich	SE7 8SL	Permitted
138	Roadstone Coating	Tarmac	Riverside Wharf, Herringham Road, Charlton	SE7 8SJ	Permitted
140	Manufacture of Printing Inks	Apollo Colours Ltd	127 Nathan Way, West Thamesmead Business Park, London	SE28	Permitted
141	Concrete Batching	London Concrete	Angerstein Wharf, Horn Lane, Greenwich	SE10	Permitted
144	Fixed Concrete Crusher	Day Aggregates	Murphy's Wharf, Lombard Wall, Charlton	SE7 7SH	Permitted
145	Concrete Batching	Hanson Premix	303 Tunnel Avenue, Greenwich	SE100QE	Permitted
147	Fixed Concrete Crusher	Murphy's (Waste) Ltd	Transfer Station, Horn Lane, Greenwich	SE100RT	Permitted
148	Concrete Batching	CEMEX	Angerstein Wharf, Horn Link Way, Greenwich	SE100RT	Permitted
150	Concrete Batching	Euromix Concrete Ltd	Brewery Wharf, Norman Road, Greenwich	SE109QZ	Permitted
152	Vehicle Respraying	Southside Accident Repair centre	123/125 Nathan Way, Thamesmead	SE280AB	Permitted
153	Mobile Concrete Crusher	O'Keefe Construction (Greenwich) Ltd	St. Andrew's House, 1 Dreadnought Street, Greenwich	SE100PU	Permitted
154	Co-incineration of waste	King's Troop Royal Horse Artillery	Napier Lines, Artillery Road, Woolwich	SE18 4BN	Permitted

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Table of permitted dry cleaners in the Council's area

Ref	Name	Address	Postcode	Status
301	The Village Dry Cleaners	135 Lee Road	SE3 9DS	Permitted
302	Panache Dry Cleaners	192 Court Road, Eltham	SE9 4EW	Permitted
303	Westmount Dry Cleaners	146 Westmount Road, Eltham	SE9 1XA	Permitted
304	Greenwich Dry Cleaners	25 Woolwich Road, Greenwich	SE10 0RA	Permitted
305	Taylor's Cleaners	68 Herbert Road, Plumstead	SE18 3SH	Permitted
306	Westcombe Dry Cleaners	74 Westcombe Hill	SE3 7DY	Permitted
307	Morrisons Supermarket	2 Twin Tumps Way	SE28 8RD	Permitted
308	Cleantech Dry Cleaners	213 Eltham High Street	SE9 1TX	Permitted
309	Elegance Dry Cleaners	172 Westcombe Hill	SE3 7DH	Permitted
310	Collins Cleaners	3 Stratheden Parade	SE3 7SX	Permitted
311	Well Hall Express	18 Well Hall Parade, Eltham	SE9 6SP	Permitted
312	Woolwich Express	59 Woolwich New Road	SE18 6ED	Permitted
313	Cleaners of Eltham	10 Well hall Road, Eltham	SE9 6SF	Permitted
314	Tailored Press	130 Plumstead Common Road	SE182UL	Permitted
315	Soma Dry Cleaners	237 Greenwich High Road	SE108NB	Permitted
316	Collins Dry Cleaners	168 Trafalgar Road, Greenwich	SE10 9TZ	Permitted
318	Spotless Dry Cleaners	168 Shooters Hill Road	SE3 8RP	Permitted
319	Early Bird Dry Cleaners	139 Plumstead High Street	SE18 SE	Permitted
320	Sew Clean	252 Plumstead High Street	SE18 1JN	Permitted
321	Rosam Dry Cleaners	173 Trafalgar Road	SE109TX	Permitted
322	Unique Dry Cleaners	6 Frances Street, Woolwich	SE185EF	Permitted
324	Victory Dry Cleaners	196 Bexley Road	SE9 2PH	Permitted
325	Asik Dry Cleaners	88 Plumstead High Street	SE18 1SL	Permitted
326	Attrill's	413, Footscray Road	SE9 3UL	Permitted
327	Village Dry Cleaners	1 The Village, Charlton	SE7 8UG	Permitted
328	Royal Dry Cleaners	27 Lewisham Road	SE137QS	Permitted
330	New Eltham DC	397 Footscray Road	SE9 2DR	Permitted
331	T & T Launderette and Dry Cleaners	9 Anglesea Road	SE18 6EG	Permitted
332	Comet 2 Dry Cleaners	55 Well Hall Road	SE9 6SZ	Permitted
333	Vina Dry Cleaners	92 Royal Hill	SE10 8RT	Permitted

